

# Supercell Criteria Map

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One of the products associated with the ensemble cloud model is the Supercell Criteria Map. The conceptual model of a supercell storm assumes that such storms possess persistent, rotating, mid-level updrafts (Fig. 1). Thus, there are two criteria that must be met for a modeled

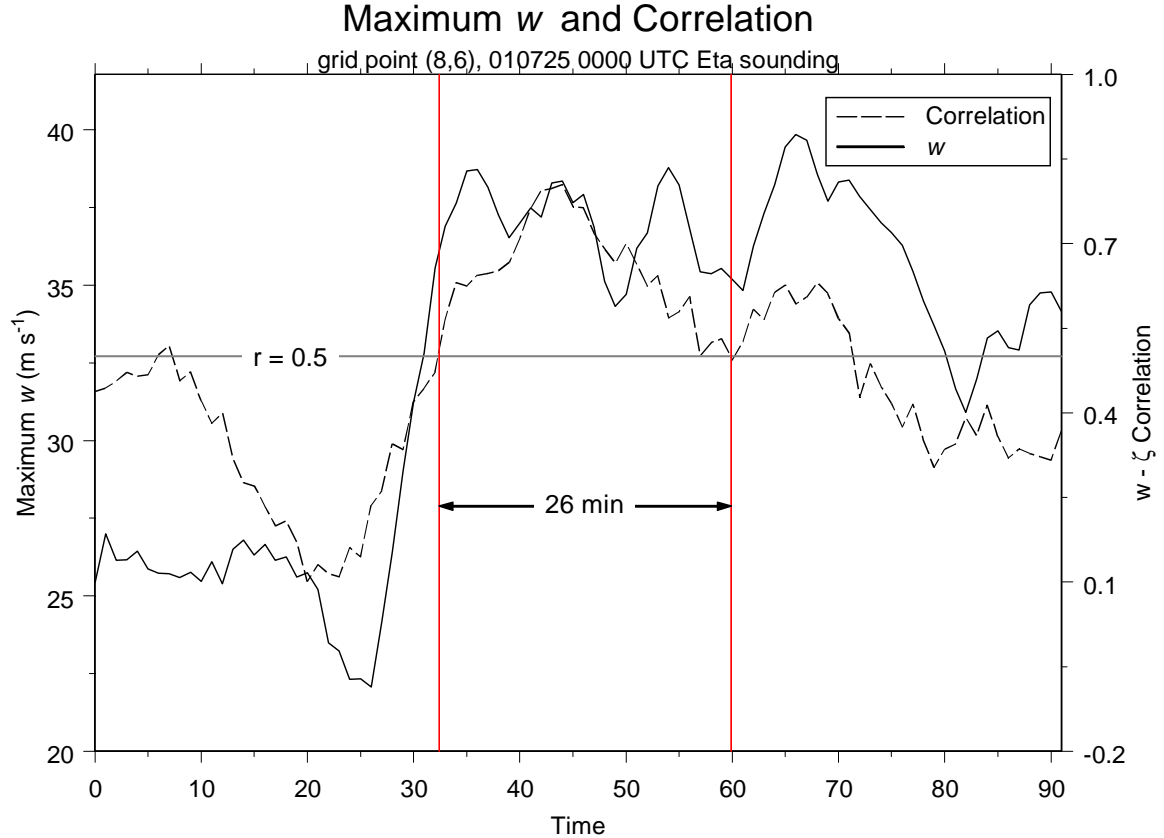


FIGURE 1. An example of a moderately strong, long-lived storm, that meets supercell criteria. The solid trace is the timeseries of maximum  $w$  in the model domain, and the dashed line is the timeseries of mid-level  $w$ - $\zeta$  correlation ( $r$ ) for  $w > 1.0 \text{ m s}^{-1}$ . The red vertical lines show the period for which  $r$  exceeds 0.5 for at least 20 min.

storm to be classified as a possible supercell. First, the storm must last at least 40 min. Second, the correlation ( $r$ ) between mid-level updrafts stronger than  $1 \text{ m s}^{-1}$  and mid-level vertical vorticity must be at least 0.5 for at least 20 min.

These constraints are rather arbitrary. The correlation  $r = 0.5$  condition is one used commonly in numerical cloudmodel studies, but has been used primarily on simulations of known supercells. It has not been used in any kind of operational setting. In the previous work on ensemble modeling, only storm lifetime was used as a proxy for supercell-like status. However, in many cases, long-lived storms with very strong vertical velocities never develop a strong correlation structure (Fig. 2)

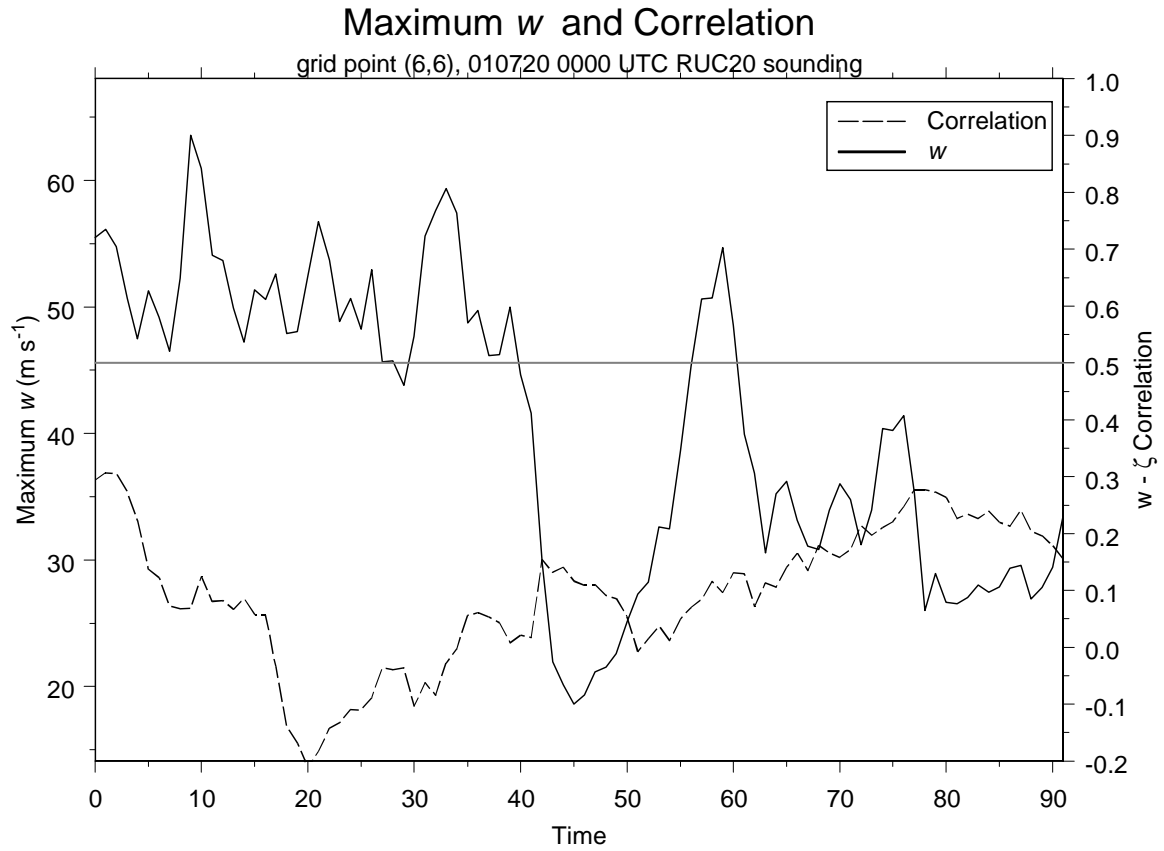


FIGURE 2. An example of a very vigorous, long-lived storm that does not meet supercell criteria.

This product is purely experimental in nature. While maps are provided showing which grid points generate storms with supercell characteristics, as with other maps of ensemble characteristics, these should not be interpreted literally. These maps are provided purely to help show the forecasters the soundings that tend to generate supercells within the cloud model. These soundings should be inspected and compared to the soundings that are expected over the region during the day.